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| 10/507,359 | 09/10/2004 | Johan Bernard Ubbink | 115808-504 | 5698 |

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CHICAGO, IL 60690

| EXAMINER | |
|---|---|
| BADR, HAMID R | |
| ART UNIT | PAPER NUMBER |
| 1794 | |

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| 12/28/2009 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/507,359 | UBBINK ET AL. | |
| | Examiner | Art Unit | |
| | HAMID R. BADR | 1794 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3 and 5-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3 and 5-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. Applicants amendment filed 10/20/2009 is acknowledged.

2. The rejections under 35 U.S.C 112 second paragraph are withdrawn due to the amendments made by the applicants.

Claims 1, 3, 5-14 are being considered on the merits.

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 11-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 11 recites the limitation "drying the first preparation to form particles, mixing the particles and further components" is not supported by the specification. For support, applicants point to page 4, line 35 to page 5; line 3 and page 11 lines 14-33. It is noted that page 4 line 35 to page 5 line 3 depicts information regarding the storage stability of *Enterococcus feacium* Page 11 lines 14-33 discloses the carbohydrates and their percentage in the matrix. Page 11 lines 3-6 discloses that if carrier material is used, it may also be part of the inner matrix. Page 11, lines 19-25 discloses the type and percentage of carbohydrates. Page 11, lines 31-35

discloses drying the micro-organisms with carbohydrates. Page 17, line 10 to page 18 line 5 and page 17 lines 34-36 discloses possible drying devices. However, while there is support to mix the microorganisms and further components followed by drying or for mixing the microorganisms and the inert carbohydrate followed by spray drying or fluidized bed drying, this does not appear to provide support to recite mixing the microorganisms and the inert carbohydrate followed by broad disclosure of drying and then adding further components.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

2. Claims 1, 5-7, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Casas-Perez (US 5,480,641; hereinafter R1).

3. R1 discloses methods and product for direct feed microorganisms such as Lactobacillus reuteri delivered in pellets (compacted whey particles) (Abstract).

4. R1 teaches coating the palletized whey particles with lyophilized L. reuteri cells suspended in oil (col. 3, lines 55-57) or the suspension of L. rerteri in oil is mixed with whey powder and then the mixture is compressed into pellets (compressed whey particles) or tablets. (Col. 3, lines 62-65). Given that oil is impermeable to moisture, the pellet will be impermeable to moisture.

5. It is noted that whey inherently contains lactose in the range of 50-70%, it is clear that an inert carbohydrate is included in the pellets as taught by R1 and as presently claimed. It is also noted that whey contains proteins.

6. The pellets may have different sizes (Col.4, lines 10-20) for instance particles which go through mesh 8 (2.38 mm) but retained by mesh 20 (0.84 mm) or particles going through mesh 0.25 inch (6.35 mm) but retained by mesh 8 (2.38 mm). It is clear that pellets having size between 2.38 mm and 0.25 inch would inherently possess volume as presently claimed.

7. R1 teaches that whey pellets may contain $5x10^7$ to about $10^8$ cells/g whey (Col. 4, lines 25-27).

8. Given that the cells are lyophilized (below water activity of 0.3) and the suspending agent and binder is oil and the supporting matrix is whey powder, the water activity of less than 0.3 will be inherent to the pellets.

9. R1 teaches using 1—15 lbs/sq. in pressure to produce the compacted pellets (Col. 4, lines 10-11)

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1, 3 and 5-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okonogi et al. (US 4888171; hereinafter R2) in view of Klapwijk et al. (EP 0 298 605; hereinafter R3) and Van Lengerich (WO 99/48372; hereinafter R4).

12. R2 discloses a granular product containing dried viable microorganism cells, which has been protected against permeation of environmental moisture and atmospheric oxygen (Col. 2, lines 36-39). It also teaches of the materials used in the formation of the core of their product (Col. 3, lines 9-23). The coating of their product is explained in terms of the composition and function. It teaches of the use of the binding materials for coating the product in order to protect it against permeation of the environmental moisture and atmospheric oxygen. It further explains the use of shellac or zein for enteric coating (Col. 5, lines 17-34; Col. 8, lines 33-46). It specifies the granular product to have a mean diameter of 1.5 mm (Col. 9, lines 1-2). Assuming a spherical shape, the mean granule volume is calculated to be 1.77 $mm^3$.

13. R2 gives details of making a granular product containing dried viable bacterial cells, the product being substantially free of water (Claims 1 and 4). It also mentions that the water content of the core material is preferably as low as possible, less than 5% (w/w) (Col. 3, lines 22-23).

14. R2 discloses the viable count of lactic acid bacteria in their product to be $14 \times 10^8$ cells/g. The survival rate has been calculated to be 98% (Col. 9, lines 6-13). It is claimed that the cell survival rate in their product exceeds that of the conventional product during prolonged storage periods (Abstract, Table 1, Table 2, Table 3).

15. R2 teaches of the materials to be used for composing the core of their product. They clearly teach of materials such as sugar or sugar/starch composition (fillers) which can be pelletized. Use of dried viable microorganisms (functional ingredient) in the core is disclosed (Col. 3, lines 9-23). Use of binding and plasticizing materials (fats/oils, propylene glycol fatty acid ester) is further disclosed and examples of binding materials are given (Col. 3, lines 30-34). Use of lubricant is disclosed in experiment 2 (Col. 6, formulation table).

16. R2 explain the use of sugar/starch compositions to be used for the core of their product. It mentions that almost anything edible that can be pelletized may be used in the core of their product including palletized dried viable microorganisms (Col. 3, lines 13-23).

17. R2 discloses the concept of coating their granular product in order to protect it from environmental moisture and atmospheric oxygen. (Col. 2, lines 36-39). It further explains the use of various coating materials, which provide palatable taste, flavor, color and enteric coating. (Col. 5, 17-34; Col. 8, lines 33-46).

25. R2 teaches making particles by pelletized various ingredients including saccharides, and acid crystals. They mention that particles of such materials and any other edible material may be prepared by palletized these materials. For instance, dried viable microorganisms, a pelletized product of such powder mixes may be used as the core material.

26. While the examples of R2 teach amounts of microorganisms outside the scope of the present claims, these are just a few preferred embodiments of R2. A fair reading of

the reference as a whole does not limit the amount of microorganisms. It would have been obvious for one of ordinary skill in the art to choose the amount of microorganisms, including that presently claimed, depending on the end use of the granular product as well as to produce a less expensive product.

27. R2 is silent on the water activity ($a_w$) of their pellets.

28. R3 discloses the process of making supported lactic acid bacterial compositions where the water activity of the supported flora products is 0.3 or less, particularly 0.2 or less. They also mention that improved storage life is provided with water activity values 0.15 or less (Page 3, lines 47-49).

29. R4 discloses a product that contains encapsulated live organisms. The matrix composition of his invention comprises a plasticizer and a substantial amount of a free flowing mixture (page 3, lines 8-15). The coating of the pellets is discussed in example 2 and 3 (page 35 and 36). He discloses the dimensions of the product where the extruded rope may have a cross sectional diameter 0.5 mm to about 3 mm. Assuming an average pellet diameter of 1.75 mm, the pellet volume is calculated to be about 2.8 $mm^3$

30. R4 describes the product to be non-expanded, non-puffed, and substantially non-cellular. It is also mentioned that the starch is substantially ungelatinezed, and not substantially destructurized or dextrinized. Specific densities of the products are disclosed to be about 0.8 to 1.5 $g/cm^3$ (Page 33, lines 8-13).

31. R4 teaches of the use of the pellets as food or their incorporation into foods, nutraceuticals and pharmaceuticals . A variety of foods having various moisture levels are mentioned. His product comprises at least one component of the food e.g. yogurt

which can contain nonfat dry milk, or gelatin, or lactose (Page 33 line 14 to page 34 line 16).

32. R4 teaches of the incorporation of pellets containing live mircro-organisms into various foods where the food and the pelleted product share at least one ingredient. He mentions that the encapsulated product may be incorporated, with or without grinding, into foods for human or animal consumption. The foods, which are exemplified do share, at least, one component with the granulated product (Page 33, lines 14-23 and page 34, lines 1-2).

33. It would have been obvious to one of ordinary skill in the art , at the time the invention was made, to modify the teachings of R2 by using the teachings of R3 and R4 to make the probiotic delivery system of the instant application. One would have done so to receive the benefits of a product which could be used as a delivery system for dried viable organisms. Absent any evidence to contrary and based on the combined teachings of the cited references, there would have been a reasonable expectation of success in making a probiotic delivery system with characteristics outlined in the instant application.

34. Claim11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Casas-Perez (US 5,480,641; hereinafter R1).

35. The disclosure by R1 is hereby incorporated by reference as outline in paragraphs 2-9 above.

36. R1 is silent regarding the drying of the mixed ingredients.

37. Given that R1 mixes the liquid phase which is an oil with the rest of ingredients, it is obvious that when the microorganisms are contained in a fermentation broth containing water, a drying stage is necessary. It is obvious to those of skill in the art that to protect the organisms and to preserve the pellets, the moisture content should be reduced to low levels.

***Response to Arguments***

Applicants' arguments have been reviewed thoroughly. These arguments do not deem persuasive for the following reasons:

1. Applicants argue that the amendment in claim 11 is supported by the specification and there is full support for "drying the first preparation to form particles, mixing the particles and further components" is supported by the instant specification.

a. For support, applicants point to page 4, line 35 to page 5; line 3 and page 11 lines 14-33. It is noted that page 4 line 35 to page 5 line 3 depicts information regarding the storage stability of *Enterococcus feacium* Page 11 lines 14-33 discloses the carbohydrates and their percentage in the matrix. Page 11 lines 3-6 discloses that if carrier material is used, it may also be part of the inner matrix. Page 11, lines 19-25 discloses the type and percentage of carbohydrates. Page 11, lines 31-35 discloses drying the micro-organisms with carbohydrates. Page 17, line 10 to page 18 line 5 and

page 17 lines 34-36 discloses possible drying devices. However, the pages as referenced do not support that claim language. Applicants also refer to page 11, lines 14-33 to support the language of claim 11. The information in lines 14-33 of page 11 does not support the idea that microorganisms and inert carbohydrates are mixed followed broad disclosure of drying. On the other hand there is no support to recite mixing the microorganisms and the inert carbohydrate followed by broad disclosure of drying and then adding further components anywhere in the specification. It appears that the alleged support in the instant specification is the applicants' interpretation of claim 11.

2. Applicants argue that Casas-Perez (R1) fails to disclose or suggest every element of the present claims. They argue that the inner matrix, as presently claimed, contains 40-70% of total dry mater of at least one inert carbohydrate and that Casas fails to disclose any dry weight percentages of its whey in its compressed pellet.

a. It is clearly seen that R1 anticipates this percentage of carbohydrate given that whey powder can contain 50-70% lactose. Depending on the type of the whey used namely; a regular sweet whey or a whey concentrate, it can contain 50-70% lactose. Therefore, the 100% whey component, as argued by the applicants, will provide the carbohydrate portion of the pellet as presently claimed.

3. Applicants argue that R1 does not disclose or suggest a pellet comprising a compacted inner matrix and at least one coating, wherein the inner matrix comprises a carbohydrate and viable organisms.

a. A fair reading of R1 shows that it teaches making compacted pellets containing live organisms. The core of the pellet is made of whey and as such it contains lactose. Therefore, the carbohydrate limitation of claim 1 and claim 11 is inherent in the composition used by R1. The range of number of organisms taught by R1 is about 10^6 to 10^10 cfu/g of the pelleted material. Therefore, it overlaps the claimed range of 10^5 to 10^8 cfu/g. Regarding the mixing of the of organisms with the core material, R1 teaches, in one of the embodiments, that the organisms are mixed with the dispersing material which happens to be an oil and then mixed uniformly with the core material. Therefore, the mixing of the organisms and the preparation of the mixture before compacting and pelletizing are also anticipated by R1.

b. Regarding the carbohydrate limitation of claim 1, the open ended language of the claim indicated by "comprising" shows that R1 anticipates this element as well. Therefore, in addition to the carbohydrate, the core can comprise other ingredients including proteins as contained in whey and as taught by R1.

c. R1 teaches of using an oil in making the pellets; which is considered a moisture barrier. When used as a coating it satisfies the coating requirement. When used as a dispersing agent, it also can act as a coating because the oil is dispersed throughout the pellet including the surface of the pellet where it acts as a coating material. This is due to the hydrophobicity of the oil used.

4. Applicants argue that Casas (R1) discloses two embodiments. Applicants try to compare claim 1 to that of the teachings of Casas in a tabulated summary.

a. Applicants conclusion that Casas' core is only whey is not accurate because whey contains 50-70% lactose.

b. In one embodiment Casas teaches of coating the pellets. In the other embodiment Casas teaches of mixing the organisms with the whey matrix. Therefore, Casas anticipates both coating and mixing organisms with the matrix.

It should be realized that elements from different embodiments of a single reference can be combined for anticipation purposes if the reference teaches or suggests such combination to one of skill in the art. It is clear that Casas suggests both mixing the organisms with the whey matrix and also the coating concept, therefore, Casas anticipates the presently claimed invention.

5. Applicants argue that regarding the rejections under 103(a) obviousness, even if the references are combinable, R2, R3 and R4 fail to disclose or suggest every element of the present claims.

a. Please refer to the disclosures by R2, R3 and R4 to see that every element of the presently claimed invention is disclosed by the combination of these references. On the other hand, In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

6. Applicants further argue that Okonogi teaches coating a core with adherent microorganism material.

a. Applicants' attention is drawn to col. 3, lines 15-23. Okonogi specifically teaches that the core material can be a palletized product of microorganisms in powder form mixed with sugar and other additives. Therefore, applicants allegations that Okonigi teaches coating a core with adherent microorganism material is not accurate, because according to Okonogi, the organisms are mixed with the matrix.

7. Applicants argue that the cited references are not properly combinable because the references are directed to completely different inventions in that R2 and R4 are directed toward pelleted compositions while R3 is not directed to pelleted compositions.

a. By referring to the disclosure by R3, one can see that R3 is teaching a very fundamental element of water activity with specific reference to lactic acid bacteria. The claims as presented are directed to the role of water activity and the lactic acid bacteria. Therefore, R3 is relevant to the presently claimed invention.

Furthermore, while R2 teaches a palletized, coated product containing live microorganisms, as presently claimed, R3 and R4 teach of other technical features. As such R3 and R4 do not have to disclose the exact features of the claimed invention. However, note that while R3 and R4 do not disclose all the features of the present claimed invention, R3 and R4 are used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, and in combination with the primary reference, discloses the presently claimed invention.

8. Applicants argue that claims 11-12 are not obvious over Casas (R1).

a. Casas discloses embedding microorganisms in why powder. Whey powder can contain 50-70% lactose. Therefore, the requirement for carbohydrate is satisfied. Whey also contains proteins and some minerals. Therefore, there are other components in whey which are inherent in whey.

In conclusion, the cited references disclose all elements of the presently claimed invention.

***Conclusion***

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HAMID R. BADR whose telephone number is (571)270-3455. The examiner can normally be reached on M-F, 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks can be reached on (571) 272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hamid R Badr
Examiner
Art Unit 1794

/Keith D. Hendricks/

Supervisory Patent Examiner, Art Unit 1794